

Juvenile Coho Salmon Passage
at the Elwha River Dams:
A Comparison of Short- and Long-Term
Survival Estimates

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INTRODUCTION

In 1984, Fisheries Assistance Office (FAO) Olympia began a study of juvenile coho salmon passage survival at the Elwha River dams. Results of this work were intended for use in a larger effort aimed at restoring anadromous salmonids to the upper Elwha River basin. The FAO passage study incorporated both short- and long-term estimation of coho passage survival. The short-term estimate was intended for immediate use in project planning, while the long-term estimate was intended to evaluate any latent mortality due to dam passage and also serve as a check on short-term estimation methods.

An FAO report by Wunderlich and Dilley (1985) described in detail the short-term mortality study as well as initiation of the long-term survival study based on coded-wire tagging (CWT). Briefly, four test groups of marked (freeze-branded) coho smolts were released in Lake Mills over the spring outmigration in 1984 (Figure 1). Eight control groups of marked coho smolts were also released below the Elwha Dam on a weekly basis over the outmigration period. Test and control groups were recaptured one and one half river miles downstream of Elwha Dam in an inclined plane scoop trap. Recapture rates of control groups were used to define trap efficiency, which in turn was used to estimate short-term survival of test groups passing the Elwha dams. Additionally, each test group and four of the control groups were uniquely coded-wire tagged for purposes of estimating long-term survival upon recovery in the 1985 coho fisheries and the Elwha River hatcheries.

This report evaluates CWT recovery data from those tag returns, provides long-term survival estimates based on CWT data, and compares long-term survival estimates to original short-term estimates developed in smolt trapping studies of the same groups in 1984. Because final reporting and verification of marine tag recoveries of coho require nearly two years, this analysis was only recently possible.

METHODS

Final recovery data from the eight CWT test and control groups released in the 1984 FAO study (Wunderlich and Dilley 1985) were acquired from Pacific Marine Fisheries Commission (PMFC), which collates and organizes such data on the Pacific Coast. I also acquired recovery data for three coincidental releases of coded-wire tagged coho released from the Elwha Tribal Hatchery in 1984. The latter tag groups were of the same stock and brood as test and control groups and were released by the Elwha Tribe to evaluate the effects of time and size of release on survival. They provided additional perspective on marine survival and distribution of Elwha hatchery coho from this brood year. The Appendix of this report contains a complete listing of the detailed recovery data obtained for all tag groups.

Because only a portion of coastwide salmon landings are usually sampled, actual (observed) mark recoveries of Elwha study groups were expanded by the inverse of the sampling rate to estimate the total marked catch. Catch expansion factors varied from fishery to fishery, and were developed and applied by the recovery agencies on the Pacific Coast involved in fishery sampling. Stohr and McGowan (1987) describe the methods used by Washington Department of Fisheries to expand the 1985 salmon catches in Washington waters; other recovery agencies employed similar expansion methodologies. Expanded catch data used in this analysis therefore represent a summation of catch expansions as supplied to PMFC by the various recovery agencies in 1985. Principal recovery agencies for the Elwha study groups were the Washington treaty tribes, Washington Department of Fisheries, Oregon Department of Fish and Wildlife, and Canada Department of Fisheries and Oceans.

Absolute survival rates for the Elwha CWT groups were computed by dividing total expanded recoveries, as recorded by PMFC, by the size of the release group after adjustment for tag loss. Tag loss was estimated in 1984 from a standard 300-fish sample of each group taken approximately 6 weeks after tagging and at least 3 weeks before release. Sampling in this time period allowed for maximum tag loss, yet minimized handling stress associated with sampling near-smolt coho yearlings.

Initial study plans called for comparing absolute survival rates of each CWT test/control pair to arrive at a relative survival rate for each CWT test group. However, substantial differences in emigration timing among the initial test releases in Lake Mills required modification of this approach. As described in Wunderlich and Dilley (1985), hereinafter referred to as the "scoop trap" evaluation, migration of initial test release groups was delayed up to 20 days by lack of spill at Glines Canyon Dam in late April and early May of 1984 (Figure 2). Delayed springtime saltwater entry is known to positively affect survival of coho smolts in Puget Sound and coastal Washington hatcheries

(Paul Seidel, Washington Department of Fisheries, personal communication; Anonymous, 1983), and observed survival rates of Elwha control and time/size groups reflect this phenomenon (Table 1). The substantial delay experienced by initial test releases in Lake Mills, however, influenced survival to the extent that highly anomalous paired comparisons resulted (>150% relative passage survival for certain test releases). To account for this effect, only control releases that closely matched outmigrant timing of the test releases were used as a basis to calculate relative passage survival. The criterion for matching test and control outmigration was median recovery date at the scoop trap. As Figure 2 illustrates, median recovery date of the four test groups ranged from about 5/26 to 6/14 at the scoop trap. Because median control group recovery at the scoop trap occurred only 1-2 days after each release, only control group 4 (release date 5/29) approximated outmigration timing of the test groups. This group was therefore used as a basis for computing relative survival of all test groups.

Following selection of an appropriate CWT control as described above (control group 4), relative survival rates of CWT test groups were computed by dividing percent survival of expanded test recoveries by percent survival of expanded control recoveries. Statistical significance of relative differences in CWT survival (test vs. control) was evaluated with the methodology of Newman (1987).

The CWT recovery data were also evaluated for differences in marine recovery distribution which could affect recovery rates. Detailed recovery data (Appendix) were examined for anomalous time or size of catch. Additionally, the test groups (individually and in aggregate), control group 4, and Elwha Hatchery time/size group 3, were evaluated for differences in recovery distribution with a standard chi-square analysis. Time/size group 3 was included in this comparison because of its similar release timing (early June) and the assumption that it should display a similar catch distribution to that of the passage study groups, and thus serve as an additional reference point.

Size at recovery for all CWT groups was also examined to evaluate possible effects of dam passage on adult length. For this purpose, mean lengths at recovery for individual release groups were extracted from the PMFC data set and then arrayed by release location and release date. Size-at-recovery data were then evaluated qualitatively, as individual recovery lengths were not available from PMFC for statistical analysis.

RESULTS AND DISCUSSION

Comparison of short- and long-term survival rate estimates based on scoop trapping and coded-wire tagging, respectively, indicates generally close agreement between the two estimation methods (Table 2). With the exception of test group no. 3, individual group estimates vary less than a percent, and combined group estimates are within several percentage points. I cannot explain the relatively greater difference for test group no. 3. Notwithstanding this difference, overall agreement between the methods is high, suggesting that latent passage mortality was not significant.

Relative differences of CWT test and control groups, upon which the Table 2 estimates are based, were not significant at the 0.05 level, according to the methodology of Newman (1987). The difference in survival between test groups 1-4 and control group 4 (which yielded the 87.3% relative survival estimate in Table 2) was only significant at approximately the 80% confidence level ($z = 0.97$). Other differences were less significant. This particular statistical technique (Newman 1987), which was not available during study planning, is probably more conservative than other statistical techniques not expressly developed for CWT evaluations, however (Richard Comstock, FAO, personal communication). The relatively small tag group sizes used in this evaluation possibly contributed to the lower statistical significance achieved. The number of observed recoveries per tag group was, however, within the recommendations of de Libero (1986) for general coded-wire tagging applications.

Examination of coded-wire tag recovery distributions suggested that passage test and control groups were equally susceptible to the various marine fisheries, thus survival differences between test and control groups should reflect dam passage losses. Chi-square tests for differences in recovery distributions among the various passage test, control, and hatchery time/size groups were not significant ($P < 0.05$). Figure 3 illustrates the similarity in distribution of the various groups in the major recovery areas in 1985.

Absolute rates of survival for most passage study groups were higher than expected for Elwha stock (Table 1), but may be explained, at least in part, by differences in tagging and holding procedures. FAO file data indicate that tagging of Elwha Hatchery time/size groups (whose survival more closely approximated the expected survival of Elwha hatchery stock) occurred in September 1983 using fish held in outside raceways. After tagging, the time/size fish were held in circular tanks until release, and release occurred via the hatchery outfall. In contrast, the FAO passage study groups were seined from an earthen pond in February 1984, coded-wire tagged and branded, and then held in net pens in another earthen pond until outplanting via tank truck. Thus, FAO passage study fish were procured and

held differently than the time/size fish, and this may account for the observed differences in survival. Because of these potential influences on long-term survival, considerable care was taken to treat all FAO passage study groups identically until release.

Examination of CWT group lengths (lengths at recovery) in relation to release timing suggested that later emigration reduces recovery size, and this reduced size may be an additional impact related to dam passage. Table 3 shows overall mean length at recovery of the various CWT groups, arrayed in order of release. Test, control, and time/size groups show a distinct decline in mean recovery length with later release date. This phenomenon is consistent with several other investigations, including Wynoochee Dam passage studies (Dunn 1978) and Washington Department of Fisheries' coastal hatchery evaluations (Bill Hopley, Washington Department of Fisheries, personal communication). This phenomenon is believed due to a reduced period of early marine growth among later releases. As the FAO test groups emigrated from the Elwha in their order of release in 1984, despite a known delay (Figure 1), the declining lengths of these groups would still reflect a progressive lack of early marine growth. Further, migrational delay caused by lack of spill at Glines Canyon Dam evidently reduced the lengths of the test groups, as a whole, compared to control and time/size groups (Table 3).

A potential influence on CWT-based survival estimates was the loss, during hatchery holding, of portions of two control groups. This loss, however, is not believed to be of consequence in study results. As Table 1 shows, shortages in control groups 1 and 4 were detected on their respective release dates. These shortages resulted from tears due to routine cleaning of holding pen mesh material. Fish lost in this manner had access to the Elwha River via the hatchery outfall near river mile 0.5 and, therefore, possibly emigrated prior to their scheduled planting date. In the case of control group 1, this may partially explain its relatively poor survival (0.75%). Recovery data from control group 1 were not used for survival calculations, however. In contrast, control group 4 was the basis for CWT passage survival estimates, but it exhibited both survival and size-at-recovery values consistent with other control groups, and those values appeared inherently reasonable. Nonetheless, assuming that 17.7% of group 4 (the total loss noted in Table 1) survived at a conservative rate of only 3.5% due to earlier emigration from the earthen pond, recalculated CWT survival estimates would still be similar to those presented in Table 2. Under these circumstances, for example, relative survival of all CWT test groups combined would be reduced to 83.1% compared to the table value of 87.3%. This lesser value (83.1%) is still in close agreement with the corresponding scoop trap estimate in Table 2.

SUMMARY

This report compares short- and long-term survival estimates for coho smolts passing the Elwha River dams in 1984. Short-term survival estimates were based on scoop trap estimates of test groups passing the Elwha dams, and thus represent smolt survival through these structures. Long-term survival estimates, on the other hand, were independently computed using adult CWT recovery data for those identical groups, and thus are a measure of long-term survival of smolts passing the Elwha dams. Adult lengths at recovery in the CWT data base were also examined to identify passage-related effects on size of fish contributed to the fisheries or recovered at the hatchery racks.

The principal findings from this analysis were:

- 1) Overall agreement between the two dam-survival estimates was good. Individual test group survivals ranged from about 78% to 94% for each method, while the overall means were 85% and 87% for short-term and long-term survival estimates, respectively. Loss of a portion of the coded-wire tag control may have slightly elevated the CWT-based survival estimates. There was no evidence of significant latent mortality for coho smolts passing the Elwha dams, however.
- 2) Short-term, scoop-trap based estimates of passage survival at the Elwha dams appear to yield useful estimates of long-term coho survival, and may eliminate the need for further CWT estimates of dam passage mortality.
- 3) Delay in outmigration, such as occurred at Glines Canyon Dam in 1984, evidently caused a decrease in adult size at recovery. Such smaller adult size is believed due to a period of reduced early marine growth. This loss in adult size is an additional potential impact associated with Glines Canyon Dam when prolonged lack of spill delays outmigration.

STRAIT OF JUAN DE FUCA

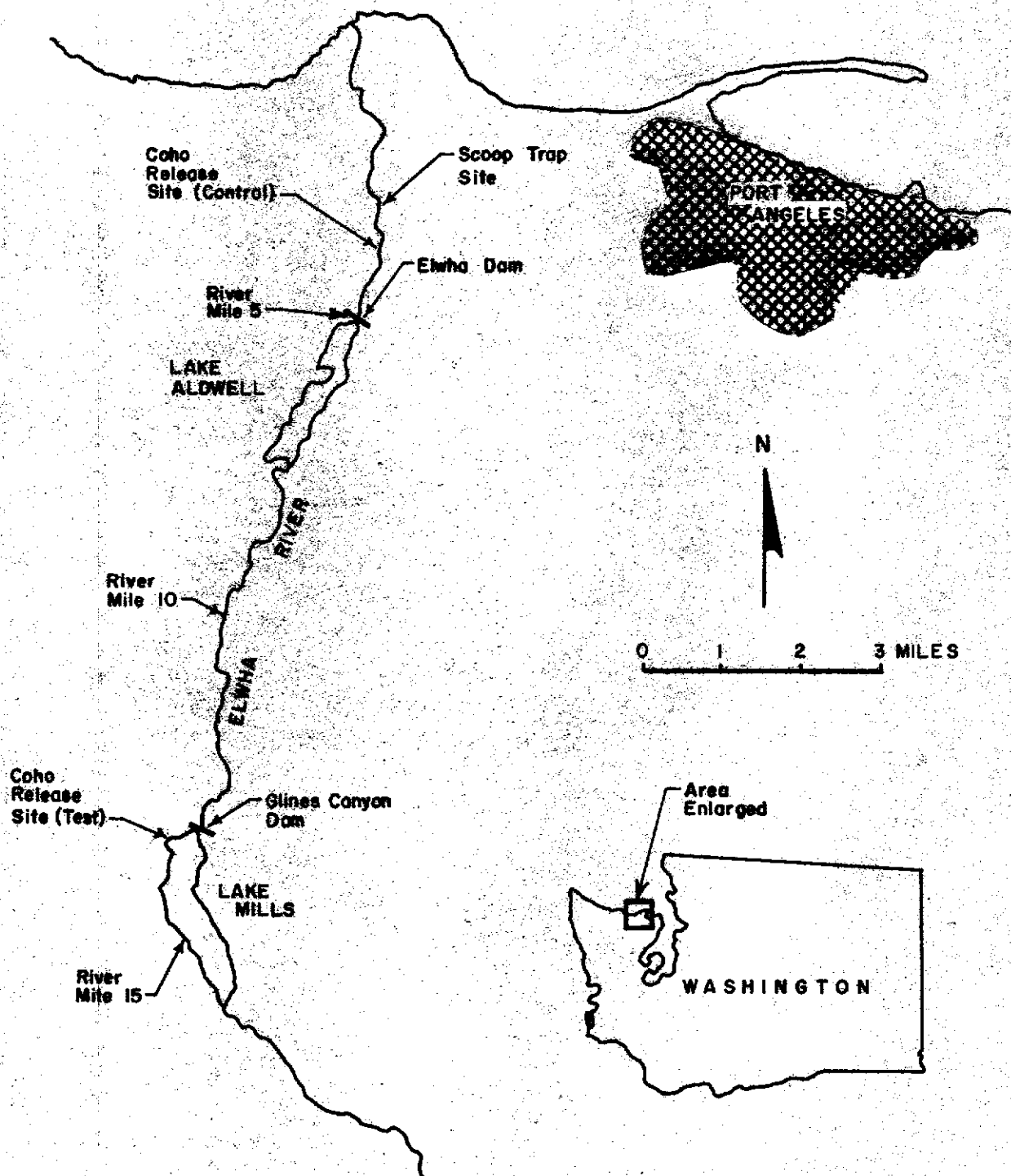


Figure 1. The Elwha River and project features.

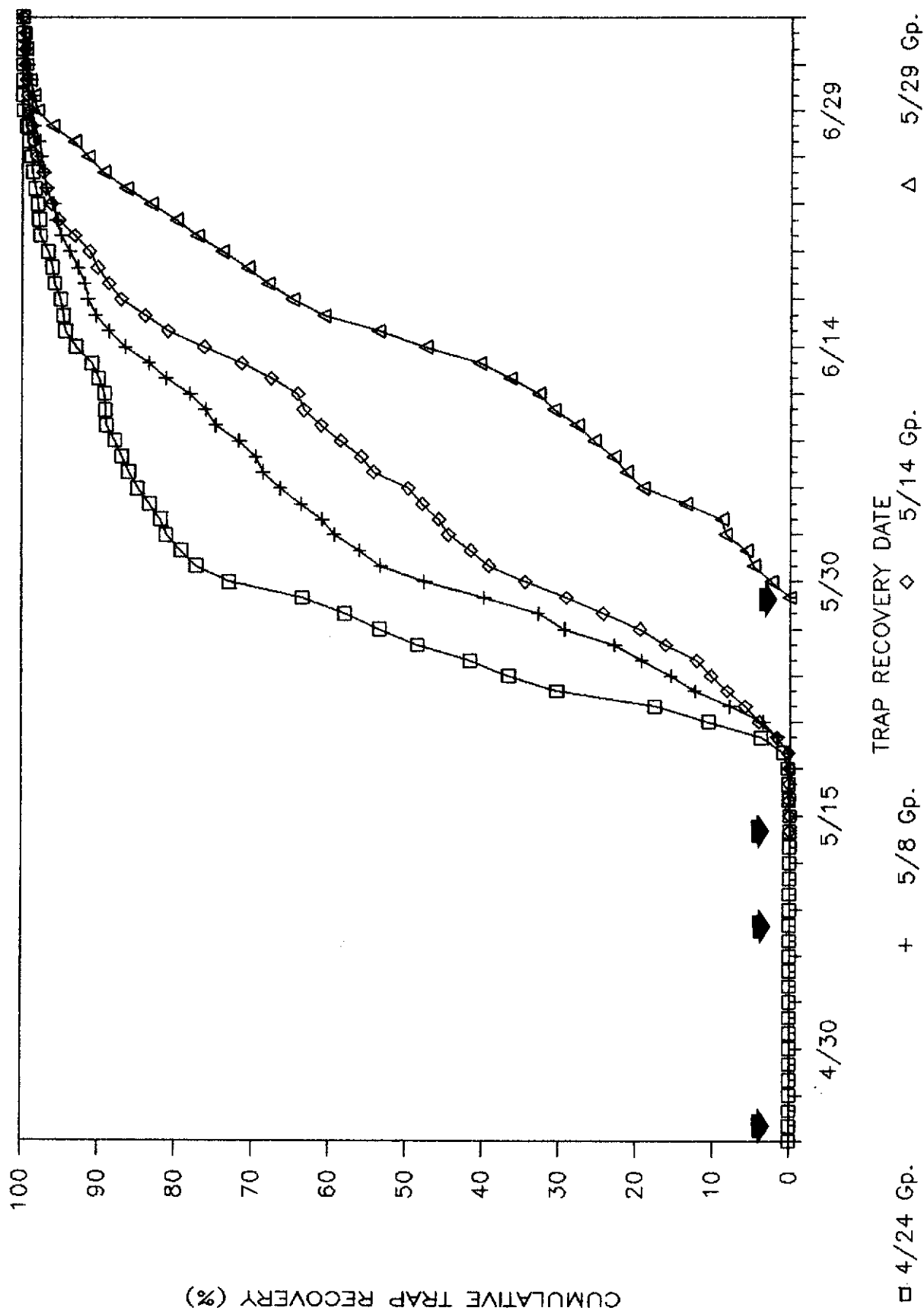


Figure 2. Cumulative scoop trap recoveries of the four coded-wire tagged test groups released in Lake Mills in 1984 (source: Wunderlich and Dilley 1985). Arrows denote release dates.

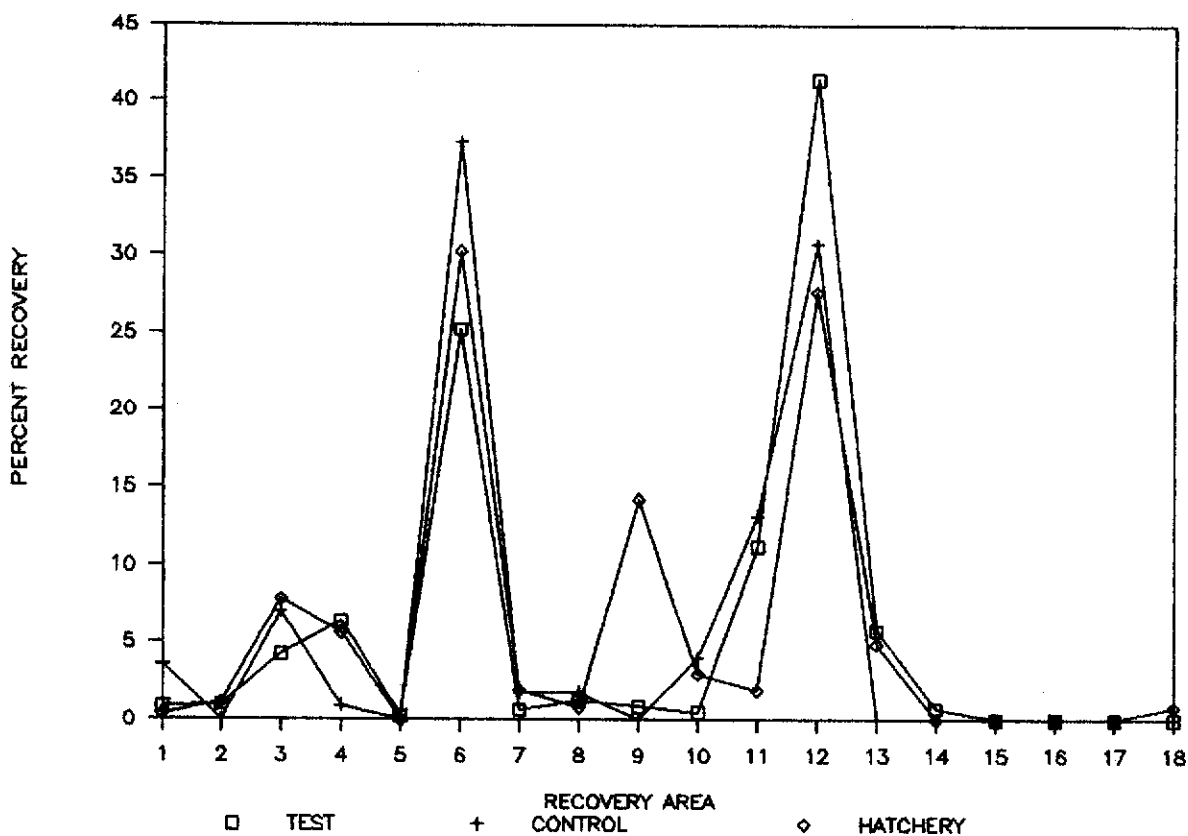


Figure 3. Percent recovery of Elwha coded-wire tag coho in 18 principal recovery areas in 1985. Test groups 1-4, control group 4, and Elwha Hatchery time/size group 3 are shown. Recovery areas are: 1- Oregon ocean troll; 2- Oregon ocean sport; 3- Washington ocean troll; 4- Puget Sound sport; 5- Washington coastal net; 6- Puget Sound net; 7- Washington ocean sport (charterboat); 8- Washington ocean sport (kickerboat); 9- Washington ocean Indian troll; 10- Elwha Hatchery; 11 N.W. Vancouver Island troll; 12 S.W. Vancouver Island troll; 13- Juan de Fuca net; 14- Georgia Strait sport; 15- Georgia Strait net; 16- So. central B.C. troll; 17- No. central B.C. troll; 18- Fraser gillnet.

Table 1. Release and recovery data for Elwha coded-wire tag groups (1982 brood).

Release group	Rel. location	Tag code	Rel. date	Rel. no. (tagged)	Total observed recoveries	Total estimated recoveries	Estimated survival
Test no. 1	Lake Mills	5-15-16	4/24/84	4,407	55	221	.0501
Test no. 2	Lake Mills	5-15-19	5/8/84	4,886	66	221	.0452
Test no. 3	Lake Mills	5-15-18	5/14/84	5,001	63	242	.0484
Test no. 4	Lake Mills	5-15-21	5/29/84	3,542	38	147	.0415
Control no. 1 ^a	River mile 4	5-15-20	4/25/84	3,489	10	26	.0075
Control no. 2	River mile 4	5-15-23	5/8/84	3,770	37	112	.0297
Control no. 3	River mile 4	5-15-22	5/15/84	3,275	35	152	.0467
Control no. 4 ^b	River mile 4	5-15-17	5/30/84	4,235	71	226	.0534
Time/size no. 1	Elwha Hatchery	5-14-32	4/20/84	7,720	59	196	.0254
Time/size no. 2	Elwha Hatchery	5-14-31	5/15/84	7,782	59	202	.0260
Time/size no. 3	Elwha Hatchery	5-14-30	6/4/84	8,145	80	270	.0331

^aApproximately 33% of this group escaped the hatchery holding pen prior to the scheduled release date.

^bApproximately 17.7% of this group escaped the hatchery holding pen prior to the scheduled release date.

Table 2. Estimated survival rates for coho smolts passing the Elwha dams using short-term (scoop trap) and long-term (coded-wire tag) recovery data.

Test group	Survival estimate(%)	
	Scoop trap	Coded-wire tag
No. 1	93.9	93.8
No. 2	83.6	84.6
No. 3	81.3	90.6
No. 4	78.5	77.7
Nos. 1, 2 and 3 combined	86.2	89.7
Nos. 1, 2, 3, and 4 combined	84.7	87.3

Table 3. Lengths at recovery of Elwha coded-wire tag groups.

Group	Release date	Tag code	Mean recovery length(mm)	Range of monthly means(mm)	(n)
Test no. 1	4/24/84	5-15-16	626	567-675	53
Test no. 2	5/8/84	5-15-19	610	540-710	63
Test no. 3	5/14/84	5-15-18	605	555-700	59
Test no. 4	5/29/84	5-15-21	587	541-642	37
Control no. 1	4/25/84	5-15-20	659	579-730	10
Control no. 2	5/8/84	5-15-23	647	565-672	37
Control no. 3	5/15/84	5-15-22	621	578-750	33
Control no. 4	5/30/84	5-15-17	612	568-634	70
Time/size no. 1	4/20/84	5-14-32	647	580-669	57
Time/size no. 2	5/15/84	5-14-31	613	580-685	59
Time/size no. 3	6/4/84	5-14-30	601	569-637	78

ACKNOWLEDGMENTS

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The Lower Elwha Tribe also provided fish and hatchery space to initiate this study, and we appreciate their cooperation in this endeavor.

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Appendix. A detailed listing of Elwha coded-wire tag recovery data arranged in ascending tag code order.

SORTING TAGCODE 051430.....
 PRINTING 27 OCT 1987
 1985 RECOVERIES OF TAGCODE
 051430
 BY CALENDAR MONTH

RELEASING AGENCY: ELWA
 82 COHO TAGGED: 8145 RELEASED: 06/84 STUDY TYPE: E
 #/LB: 13.0 UNTAGGED: 1282 STOCK...: ELWHA % TAG LOSS: 13.6
 SITE: ELWHA R HATCHERY: LOWER ELWHA DAYS: 42

FISHERY

AREA.....	DATA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	UNK	TOTAL
OREGON OCEAN TROLL (FINAL)															
GARIBALDI	OBS							1							1
	EST							1							1
	#LM							1							1
	MM							580							580
OREGON OCEAN SPORT (FINAL)															
DEPOE BAY	OBS								2						2
	EST								3						3
	#LM								2						2
	MM								584						584
WASHINGTON OCEAN TROLL (FINAL)															
2 GRAYS HARBOR	OBS							1							1
	EST							6							6
	#LM							1							1
	MM							490							490
3 QUILLAYUTE	OBS							2							2
	EST							16							16
	#LM							2							2
	MM							575							575
FISHERY TOTALS:	OBS							9							9
	EST							21							21
	#LM							9							9
	MM							547							547
PUGET SOUND SPORT (FINAL)															
5 SEKIU	OBS							2	1						3
	EST							7	2						9
	#LM							1	1						2
	MM							570	620						595
6 PORT ANGELES	OBS								1						1
	EST								6						6
FISHERY TOTALS:	OBS							2	2						4
	EST							7	8						15
	#LM							1	1						2
	MM							570	620						595
PUGET SOUND NET (FINAL)															
4B NEAH BAY	OBS								1						1
	EST								3						3
	#LM								1						1
	MM								530						530
5 CLALLAM BAY	OBS						3		5	4					12
	EST						5		9	6					20
	#LM						3		5	4					12
	MM						557		600	665					611
ELWHA RIVER	OBS								3	22					25
	EST								7	51					59
	#LM								3	22					25
	MM								660	625					629

051430

BY CALENDAR MONTH

FISHERY

AREA..... DATA JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC UNK TOTAL

PUGET SOUND NET (FINAL) - (CONTINUED)

FISHERY TOTALS:	OBS	3	9	26									38
	EST	5	18	58									81
	#LM	3	9	26									38
	MM	557	612	631									621
WASHINGTON OCEAN SPORT (CHARTER BOAT) (FINAL)													
1 COLUMBIA RIVER	OBS		2										2
	EST		3										3
	#LM		2										2
	MM		565										565
2 GRAYS HARBOR	OBS			1									1
	EST			2									2
	#LM			1									1
	MM			550									550
FISHERY TOTALS:	OBS		2	1									3
	EST		3	2									5
	#LM		2	1									3
	MM		565	550									560
WASHINGTON OCEAN SPORT (KICKER BOAT) (FINAL)													
1 COLUMBIA RIVER	OBS		1										1
	EST		2										2
	#LM		1										1
	MM		570										570
WASHINGTON OCEAN TROLL (INDIAN) (FINAL)													
3 QUILLAYUTE	OBS		1										1
	EST		33										33
	#LM		1										1
	MM		590										590
4 CAPE FLATTERY	OBS		1										1
	EST		5										5
	#LM		1										1
	MM		620										620
FISHERY TOTALS:	OBS		2										2
	EST		38										38
	#LM		2										2
	MM		605										605
WASHINGTON HATCHERY (FINAL)													
ELWHA	OBS			1					6				7
	EST			1					7				8
	#LM			1					6				7
	MM			510					637				619
NW VANCOUVER ISLAND TROLL (25-27) (FINAL)													
STATISTICAL AREA 25	OBS		1										1
	EST		5										5
	#LM		1										1
	MM		601										601
SW VANCOUVER ISLAND TROLL (21,23,24) (FINAL)													
STATISTICAL AREA 21	OBS			3									3
	EST			16									16
	#LM			3									3
	MM			596									596

CONTINUE (Y/N)Y27 OCT 1987

1985 RECOVERIES OF TAGCODE

051430

BY CALENDAR MONTH

FISHERY

AREA..... DATA JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC UNK TOTAL

SW VANCOUVER ISLAND TROLL (21,23,24) (FINAL) - (CONTINUED)

STATISTICAL AREA 23	OB5	1	4	1								6
	EST	5	25	6								37
	#LM	1	4	1								6
	MM	560	571	568								569
STAT. AREAS 21, 23	OB5	2		1								3
	EST	11		3								14
	#LM	2		1								3
	MM	575		492								547
STAT. AREAS 23-24	OB5			1								1
	EST			4								4
	#LM			1								1
	MM			612								612
STAT. AREAS 21,23,24	OB5	1										1
	EST	3										3
	#LM	1										1
	MM	598										598
FISHERY TOTALS:	OB5	4	4	6								14
	EST	20	25	29								74
	#LM	4	4	6								14
	MM	577	571	577								575
FRASER GILLNET (STAT. AREAS 29A,B,C,D,E) (FINAL)												
STATISTICAL AREA 29	OB5			1								1
	EST			2								2
	#LM			1								1
	MM			516								516
JUAN DE FUCA NET (STAT. AREA 20) (FINAL)												
STATISTICAL AREA 20	OB5			1	2							3
	EST			6	8							13
	#LM			1	2							3
	MM			560	584							576
TOTALS FOR 051430	OB5	14	13	21	26				6			80
FOR 1985	EST	87	52	67	58				7			270
	#LM	14	12	20	26				6			78
	MM	570	569	591	631				637			601
SORTING TAGCODE 051431.....												
GRAND TOTALS FOR	OB5	14	13	21	26				6			80
051430:	EST	87	52	67	58				7			270
	#LM	14	12	20	26				6			78
	MM	570	569	591	631				637			601

051491

BY CALENDAR MONTH

RELEASING AGENCY: ELWA

B2 COHO

TAGGED: 7782

RELEASED: 05/84

STUDY TYPE: E

#/LB: 16.0

UNTAGGED: 1498

STOCK...: ELWA

% TAG LOSS: 15.6

SITE: ELWA R

HATCHERY: LOWER ELWA

DAYS: 41

FISHERY

AREA..... DATA JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC UNK TOTAL

WASHINGTON OCEAN TROLL (FINAL)

2 GRAYS HARBOR	OBS	1															1
	EST	6															6
	#LM	1															1
	MM	640															640
3 QUILLAYUTE	OBS	1															1
	EST	8															8
	#LM	1															1
	MM	610															610
FISHERY TOTALS:	OBS	2															2
	EST	13															13
	#LM	2															2
	MM	625															625

PUGET SOUND SPORT (FINAL)

5 SEKIU	OBS		1	1													2
	EST		2	2													4
	#LM		1	1													2
	MM		440	690													565
6 PORT ANGELES	OBS		1														1
	EST		6														6
	#LM		1														1
	MM		570														570
FISHERY TOTALS:	OBS		2	1													3
	EST		9	2													11
	#LM		2	1													3
	MM		505	690													567

PUGET SOUND NET (FINAL)

4B NEAH BAY	OBS		1	1													2
	EST		3	1													4
	#LM		1	1													2
	MM		500	570													535
5 CLALLAM BAY	OBS			1	2												3
	EST			2	3												5
	#LM			1	2												3
	MM			650	605												620
ELWA RIVER	OBS			3	19												22
	EST			7	44												51
	#LM			3	19												22
	MM			593	627												623
12 N. HOOD CANAL	OBS				1												1
	EST				5												5
	#LM				1												1
	MM				650												650
FISHERY TOTALS:	OBS		1	5	22												28
	EST		3	10	52												65
	#LM		1	5	22												28
	MM		500	600	626												617

CONTINUE (Y/N)?Y27 OCT 1987

1985 RECOVERIES OF TAGCODE

051431

BY CALENDAR MONTH

FISHERY

AREA..... DATA JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC UNK TOTAL

WASHINGTON OCEAN SPORT (KICKER BOAT) (FINAL)

4 CAPE FLATTERY	OBS	1															1
	EST	2															2
	#LM	1															1
	MM	540															540

WASHINGTON HATCHERY (FINAL)

ELWHA	OBS								1	4							5
	EST								1	5							6
	#LM								1	4							5
	MM								580	685							664

NW VANCOUVER ISLAND TROLL (25-27) (FINAL)

STATISTICAL AREA 25	OBS	3															3
	EST	19															19
	#LM	3															3
	MM	655															655
STATISTICAL AREA 27	OBS	1															1
	EST	5															5
	#LM	1															1
	MM	610															610
FISHERY TOTALS:	OBS	4															4
	EST	24															24
	#LM	4															4
	MM	644															644

SW VANCOUVER ISLAND TROLL (21,23,24) (FINAL)

STATISTICAL AREA 21	OBS	1															1
	EST	5															5
	#LM	1															1
	MM	550															550
STATISTICAL AREA 23	OBS	3	1														4
	EST	18	3														22
	#LM	3	1														4
	MM	612	551														597
STATISTICAL AREA 24	OBS	3	4														7
	EST	14	22														36
	#LM	3	4														7
	MM	580	580														580
STAT. AREAS 21, 23	OBS	1	2														3
	EST	5	9														14
	#LM	1	2														3
	MM	630	655														647
FISHERY TOTALS:	OBS	5	7	3													15
	EST	25	40	12													78
	#LM	5	7	3													15
	MM	584	594	620													596

JUAN DE FUCA NET (STAT. AREA 20) (FINAL)

STATISTICAL AREA 20	OBS	1															1
	EST	4															4
	#LM	1															1
	MM	555															555
TOTALS FOR 051431	OBS	7	16	9	22	1	4										59
FOR 1985	EST	39	82	24	52	1	5										202
	#LM	7	16	9	22	1	4										59
	MM	596	584	617	626	580	685										613

SORTING TAGCODE 051432.....

CONTINUE (Y/N)?Y27 OCT 1987

1985 RECOVERIES OF TAGCODE

051431

BY CALENDAR MONTH

FISHERY

AREA..... DATA JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC UNK TOTAL

GRAND TOTALS FOR	OBS						7	16	9	22	1	4		59
051431:	EST						39	82	24	52	1	5		202
	#LM						7	16	9	22	1	4		59
	MM						596	584	617	626	580	685		613

051432

BY CALENDAR MONTH

FISHERY

AREA..... DATA JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC UNK TOTAL

NW VANCOUVER ISLAND TROLL (25-27) (FINAL)

STATISTICAL AREA 25	OBS						1						1
	EST						5						5
	#LM						1						1
	MM						660						660
STATISTICAL AREA 26	OBS					1							1
	EST					6							6
	#LM					1							1
	MM					556							556
FISHERY TOTALS:	OBS					1	1						2
	EST					6	5						10
	#LM					1	1						2
	MM					556	660						608

SW VANCOUVER ISLAND TROLL (21,23,24) (FINAL)

STATISTICAL AREA 21	OBS						1						1
	EST						5						5
	#LM						1						1
	MM						644						644
STATISTICAL AREA 23	OBS					1	1	1					3
	EST					5	7	6					18
	#LM					1	1	1					3
	MM					630	660	699					663
STATISTICAL AREA 24	OBS					1	1						2
	EST					5	5						10
	#LM					1	1						2
	MM					558	619						589
STAT. AREAS 21, 23	OBS						1						1
	EST						5						5
	#LM						1						1
	MM						571						571
STAT. AREAS 23-24	OBS						1	2					3
	EST						4	6					11
	#LM						1						1
	MM						531						531
FISHERY TOTALS:	OBS					2	5	3					10
	EST					11	26	12					48
	#LM					2	5	1					8
	MM					594	605	699					614

NORTHERN TROLL (STAT. AREAS 1-5) (FINAL)

STATISTICAL AREA 1	OBS						1						1
	EST						7						7
	#LM						1						1
	MM						694						694

GEORGIA STRAIT NET (14-18) (FINAL)

STATISTICAL AREA 14	OBS								1				1
	EST								2				2
	#LM								1				1
	MM								774				774

JUAN DE FUCA NET (STAT. AREA 20) (FINAL)

STATISTICAL AREA 20	OBS					3	1						4
	EST					14	3						17
	#LM					3	1						4
	MM					561	664						587

051432
BY CALENDAR MONTH

FISHERY

AREA..... DATA JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC UNK TOTAL

SOUTH CENTRAL TROLL (10-12) (FINAL)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	UNK	TOTAL
STATISTICAL AREA 11	OBS														1
	EST														15
	#LM														1
	MM														610
TOTALS FOR 051432	OBS						8	12	12	26			1		59
FOR 1985	EST						34	64	39	58			1		196
	#LM						8	12	10	26			1		57
	MM						601	593	699	669			580		647

SORTING TAGCODE 051516.....

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	UNK	TOTAL
GRAND TOTALS FOR	OBS						8	12	12	26			1		59
051432:	EST						34	64	39	58			1		196
	#LM						8	12	10	26			1		57
	MM						601	593	699	669			580		647

051516
BY CALENDAR MONTH

RELEASING AGENCY: FWS

82 COHO TAGGED: 4407

RELEASED: 04/84

STUDY TYPE: E

#/LB: UNTAGGED: 528

STOCK...: ELWHA

% TAG LOSS: 10.6

SITE: LK MILLS

HATCHERY: LOWER ELWHA

DAYS: 44

FISHERY

AREA.....	DATA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	UNK	TOTAL
WASHINGTON OCEAN TROLL (FINAL)															
2 GRAYS HARBOR	OBS							3							3
	EST							17							17
	#LM							3							3
	MM							547							547
PUGET SOUND SPORT (FINAL)															
5 SEKIU	OBS									1					1
	EST									2					2
	#LM									1					1
	MM									720					720
6 PORT ANGELES	OBS											1			1
	EST											10			10
FISHERY TOTALS:	OBS									1		1			2
	EST									2		10			12
	#LM									1					1
	MM									720					720
PUGET SOUND NET (FINAL)															
4B NEAH BAY	OBS							1		1					2
	EST							2		3					5
	#LM							1		1					2
	MM							520		680					600
5 CLALLAM BAY	OBS							1		1		2			4
	EST							2		1		3			6
	#LM							1		1		2			4
	MM							600		600		675			638
ELWHA RIVER	OBS									3		15			18
	EST									7		35			42
	#LM									3		15			18
	MM									663		675			673
10 SEATTLE/SHILSHOL	OBS									1					1
	EST									9					9
	#LM									1					1
	MM									670					670
FISHERY TOTALS:	OBS							2		6		17			25
	EST							4		19		38			62
	#LM							2		6		17			25
	MM							560		657		675			661
WASHINGTON OCEAN SPORT (CHARTER BOAT) (FINAL)															
2 GRAYS HARBOR	OBS							1							1
	EST							2							2
	#LM							1							1
	MM							540							540
NW VANCOUVER ISLAND TROLL (25-27) (FINAL)															
STATISTICAL AREA 25	OBS							3		1					4
	EST							17		5					22
	#LM							3		1					4
	MM							533		645					561

CONTINUE (Y/N)?Y27 OCT 1987

1985 RECOVERIES OF TAGCODE

051516

BY CALENDAR MONTH

FISHERY

AREA..... DATA JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC UNK TOTAL

NW VANCOUVER ISLAND TROLL (25-27) (FINAL) - (CONTINUED)

STATISTICAL AREA 26	OBS	1	2										3
	EST	6	12										18
	#LM	1	1										2
	MM	595	639										617
STATISTICAL AREA 27	OBS	1											1
	EST	6											6
	#LM	1											1
	MM	640											640
STAT. AREAS 25, 26	OBS							1					1
	EST							7					7
	#LM							1					1
	MM							702					702
FISHERY TOTALS:	OBS	5	3	1									9
	EST	29	16	7									52
	#LM	5	2	1									8
	MM	567	642	702									609
SW VANCOUVER ISLAND TROLL (21,23,24) (FINAL)													
STATISTICAL AREA 21	OBS	1	2										3
	EST	5	9										15
	#LM	1	2										3
	MM	636	536										569
STATISTICAL AREA 23	OBS		1	1									2
	EST		7	6									13
	#LM		1	1									2
	MM		621	651									636
STATISTICAL AREA 24	OBS	2	2										4
	EST	11	10										21
	#LM	2	2										4
	MM	590	672										631
STAT. AREAS 21, 23	OBS		2	1									3
	EST		11	6									17
	#LM		2	1									3
	MM		631	582									614
STAT. AREAS 23-24	OBS	1											1
	EST	3											3
	#LM	1											1
	MM	560											560
FISHERY TOTALS:	OBS	4	7	2									13
	EST	20	37	12									68
	#LM	4	7	2									13
	MM	594	614	617									608
JUAN DE FUCA NET (STAT. AREA 20) (FINAL)													
STATISTICAL AREA 20	OBS		2										2
	EST		9										9
	#LM		2										2
	MM		519										519
TOTALS FOR 051516	OBS	15	12	10	17	1							55
FOR 1985	EST	72	62	39	38	10							221
	#LM	15	11	10	17								53
	MM	567	602	660	675								626

SORTING TAGCODE 051517.....

051516

BY CALENDAR MONTH

FISHERY

AREA.....	DATA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	UNK	TOTAL
GRAND TOTALS FOR	OBS							15	12	10	17	1			55
051516:	EST							72	62	39	38	10			221
	#LM							15	11	10	17				53
	MM							567	602	660	675				626

051517
BY CALENDAR MONTH

RELEASING AGENCY: FWS

82 COHO TAGGED: 4235

RELEASED: 05/84

STUDY TYPE: E

#/LB: UNTAGGED: 135

STOCK...: ELWHA

% TAG LOSS: 9.1

SITE: ELWHA R

HATCHERY: LOWER ELWHA

DAYS: 44

FISHERY

AREA.....	DATA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	UNK	TOTAL
OREGON OCEAN TROLL (FINAL)															
ASTORIA	OBS							2							2
	EST							8							8
	#LM							2							2
	MM							593							593
WASHINGTON OCEAN TROLL (FINAL)															
3 QUILLAYUTE	OBS							2							2
	EST							16							16
	#LM							2							2
	MM							585							585
PUGET SOUND SPORT (FINAL)															
5 SEKIU	OBS									1					1
	EST									2					2
	#LM									1					1
	MM									570					570
PUGET SOUND NET (FINAL)															
4B NEAH BAY	OBS							1	4						5
	EST							2	9						11
	#LM							1	4						5
	MM							560	580						576
5 CLALLAM BAY	OBS						1	2	2	1					6
	EST						2	4	3	1					11
	#LM						1	2	2	1					6
	MM						550	625	650	730					698
ELWHA RIVER	OBS								3	20					23
	EST								7	47					54
	#LM								3	20					23
	MM								673	636					641
10 SEATTLE/SHILSHOL	OBS								1						1
	EST								9						9
	#LM								1						1
	MM								680						680
FISHERY TOTALS:	OBS						1	3	10	21					35
	EST						2	6	28	48					85
	#LM						1	3	10	21					35
	MM						550	603	632	640					632
WASHINGTON OCEAN SPORT (CHARTER BOAT) (FINAL)															
1 COLUMBIA RIVER	OBS							1							1
	EST							2							2
	#LM							1							1
	MM							610							610
2 GRAYS HARBOR	OBS						1								1
	EST						2								2
	#LM						1								1
	MM						490								490

051517
BY CALENDAR MONTH

FISHERY

AREA..... DATA JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC UNK TOTAL

WASHINGTON OCEAN SPORT (CHARTER BOAT) (FINAL) - (CONTINUED)

FISHERY TOTALS:	OBS	1	1														2
	EST	2	2														4
	#LM	1	1														2
	MM	490	610														550
WASHINGTON OCEAN SPORT (KICKER BOAT) (FINAL)																	
1 COLUMBIA RIVER	OBS	1															1
	EST	2															2
	#LM	1															1
	MM	530															530
4 CAPE FLATTERY	OBS							1									1
	EST							2									2
	#LM							1									1
	MM							620									620
FISHERY TOTALS:	OBS	1						1									2
	EST	2						2									4
	#LM	1						1									2
	MM	530						620									575
WASHINGTON HATCHERY (FINAL)																	
ELWHA	OBS							2	1	5							8
	EST							2	1	6							9
	#LM							2	1	5							8
	MM							600	580	634							619
NW VANCOUVER ISLAND TROLL (25-27) (FINAL)																	
STATISTICAL AREA 25	OBS							2									2
	EST							9									9
	#LM							2									2
	MM							562									562
STATISTICAL AREA 26	OBS							1									1
	EST							8									8
	#LM							1									1
	MM							700									700
STATISTICAL AREA 27	OBS							2									2
	EST							12									12
	#LM							2									2
	MM							655									655
FISHERY TOTALS:	OBS							2	3								5
	EST							12	17								30
	#LM							2	3								5
	MM							655	608								627
SW VANCOUVER ISLAND TROLL (21,23,24) (FINAL)																	
STATISTICAL AREA 21	OBS							2	2								4
	EST							11	10								21
	#LM							2	2								4
	MM							554	586								570
STATISTICAL AREA 23	OBS							2	1	1							4
	EST							11	4	3							18
	#LM							1	1	1							3
	MM							534	625	560							573

051517
BY CALENDAR MONTH

FISHERY

AREA..... DATA JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC UNK TOTAL

SW VANCOUVER ISLAND TROLL (21,23,24) (FINAL) - (CONTINUED)

STATISTICAL AREA 24	OBS	3	1														4
	EST	16	5														21
	#LM	3	1														4
	MM	565	660														589
STAT. AREAS 21, 23	OBS	1	1														2
	EST	5	4														10
	#LM	1	1														2
	MM	518	577														548
FISHERY TOTALS:	OBS	8	5	1													14
	EST	49	24	9													70
	#LM	7	5	1													13
	MM	550	607	560													573
TOTALS FOR 051517	OBS	17	12	13	23	1	5										71
FOR 1985	EST	85	49	35	51	1	6										226
	#LM	16	12	13	23	1	5										70
	MM	568	606	621	637	580	634										612
SORTING TAGCODE 051518.....																	
GRAND TOTALS FOR	OBS	17	12	13	23	1	5										71
051517:	EST	85	49	35	51	1	6										226
	#LM	16	12	13	23	1	5										70
	MM	568	606	621	637	580	634										612

051518
BY CALENDAR MONTH

RELEASING AGENCY: FWS

82 COHO TAGGED: 5001

RELEASED: 05/84

STUDY TYPE: E

#/LB: UNTAGGED: 133

STOCK...: ELWHA

% TAG LOSS: 2.6

SITE: LK MILLS

HATCHERY: LOWER ELWHA

DAYS: 43

FISHERY

AREA		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	UNK	TOTAL
OREGON OCEAN SPORT (FINAL)															
DEPOE BAY	OBS								1						1
	EST								2						2
	#LM								1						1
	MM								610						610
COOS BAY	OBS						1								1
	EST						2								2
	#LM						1								1
	MM						560								560
FISHERY TOTALS:	OBS						1		1						2
	EST						2		2						4
	#LM						1		1						2
	MM						560		610						585
WASHINGTON OCEAN TROLL (FINAL)															
2 GRAYS HARBOR	OBS							1							1
	EST							6							6
	#LM							1							1
	MM							520							520
PUGET SOUND SPORT (FINAL)															
3 SEKIU	OBS								1						1
	EST								2						2
	#LM								1						1
	MM								570						570
6 PORT ANGELES	OBS											3			3
	EST											29			29
	FISHERY TOTALS:								1			3			4
	EST								2			29			31
FISHERY TOTALS:	OBS								1			3			4
	EST								2			29			31
	#LM								1						1
	MM								570						570
PUGET SOUND NET (FINAL)															
4B NEAH BAY	OBS								1						1
	EST								2						2
	#LM								1						1
	MM								580						580
5 CLALLAM BAY	OBS						2				2				4
	EST						4				3				8
	#LM						2				2				4
	MM						505				645				575
ELWHA RIVER	OBS								4	15					19
	EST								9	35					44
	#LM								4	15					19
	MM								648	642					649
FISHERY TOTALS:	OBS						2		5	17					24
	EST						4		11	38					54
	#LM						2		5	17					24
	MM						505		634	642					629

CONTINUE (Y/N)?Y27 OCT 1987

1985 RECOVERIES OF TAGCODE

051518
BY CALENDAR MONTH

FISHERY

AREA.....	DATA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	UNK	TOTAL
WASHINGTON OCEAN SPORT (KICKER BOAT) (FINAL)															
1 COLUMBIA RIVER	OBS														1
	EST														2
	#LM														1
	MM														510
4 CAPE FLATTERY	OBS														1
	EST														2
	#LM														1
	MM														650
FISHERY TOTALS:	OBS														2
	EST														4
	#LM														2
	MM														580
WASHINGTON HATCHERY (FINAL)															
ELWHA	OBS														1
	EST														1
	#LM														1
	MM														700
NW VANCOUVER ISLAND TROLL (25-27) (FINAL)															
STATISTICAL AREA 25	OBS														3
	EST														17
	#LM														3
	MM														602
STATISTICAL AREA 26	OBS														1
	EST														7
	#LM														1
	MM														613
STAT. AREAS 25, 26	OBS														1
	EST														3
	#LM														1
	MM														631
FISHERY TOTALS:	OBS														5
	EST														26
	#LM														5
	MM														610
SW VANCOUVER ISLAND TROLL (21,23,24) (FINAL)															
STATISTICAL AREA 21	OBS														3
	EST														13
	#LM														3
	MM														571
STATISTICAL AREA 23	OBS														9
	EST														45
	#LM														9
	MM														585
STATISTICAL AREA 24	OBS														3
	EST														17
	#LM														3
	MM														608
STAT. AREAS 21, 23	OBS														1
	EST														7
	#LM														1
	MM														626

CONTINUE (Y/N)?Y27 OCT 1987

1985 RECOVERIES OF TAGCODE

051518
BY CALENDAR MONTH

FISHERY

AREA..... DATA JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC UNK TOTAL

SW VANCOUVER ISLAND TROLL (21,23,24) (FINAL) - (CONTINUED)

STAT. AREA5 23-24	OBS	1	1	2									4
	EST	5	5	9									19
	#LM	1	1	2									4
	MM	582	508	671									608
FISHERY TOTALS:	OBS	5	10	4	1								20
	EST	27	33	17	3								100
	#LM	5	10	4	1								20
	MM	579	594	621	548								593

JUAN DE FUCA NET (STAT. AREA 20) (FINAL)

STATISTICAL AREA 20	OBS			3									3
	EST			12									12
	#LM			3									3
	MM			511									511

GEORGIA STRAIT SPORT (13-20, 28-29) (FINAL)

STATISTICAL AREA 20	OBS					1							1
	EST					6							6
TOTALS FOR 051518	OBS	12	17	11	19	3	1						63
FOR 1985	EST	51	81	36	45	29	1						242
	#LM	12	17	10	19		1						59
	MM	555	587	623	637		700						605

SORTING TAGCODE 051519.....

GRAND TOTALS FOR	OBS	12	17	11	19	3	1						63
051518:	EST	51	81	36	45	29	1						242
	#LM	12	17	10	19		1						59
	MM	555	587	623	637		700						605

051519
BY CALENDAR MONTH

RELEASING AGENCY: FW5

82 COHO

TAGGED: 4886

RELEASED: 05/84

STUDY TYPE: E

#/LB

UNTAGGED: 167

STOCK...: ELWHA

% TAG LOSS: 3.3

SITE: LK MILLS

HATCHERY: LOWER ELWHA

DAYS: 43

FISHERY

AREA..... DATA JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC UNK TOTAL

WASHINGTON OCEAN TROLL (FINAL)

2 GRAYS HARBOR	OBS	1																		1
	EST	6																		6
	#LM	1																		1
	MM	550																		550

PUGET SOUND SPORT (FINAL)

5 SEKIU	OBS							2												2
	EST							4												4
	#LM							2												2
	MM							545												545

WASHINGTON COASTAL NET (FINAL)

WILLAPA BAY	OBS								1											1
	EST								2											2
	#LM								1											1
	MM								610											610

PUGET SOUND NET (FINAL)

4B NEAH BAY	OBS	1						2												3
	EST	2						7												9
	#LM	1						2												3
	MM	550						630												603
5 CLALLAM BAY	OBS							1	2											3
	EST							2	3											5
	#LM							1	2											3
	MM							630	620											623
ELWHA RIVER	OBS							4	19											23
	EST							9	44											54
	#LM							4	19											23
	MM							643	651											650
FISHERY TOTALS:	OBS	1						7	21											29
	EST	2						18	48											68
	#LM	1						7	21											29
	MM	550						637	648											642

WASHINGTON OCEAN SPORT (CHARTER BOAT) (FINAL)

2 GRAYS HARBOR	OBS	1																		1
	EST	2																		2
	#LM	1																		1
	MM	530																		530

WASHINGTON OCEAN SPORT (KICKER BOAT) (FINAL)

4 CAPE FLATTERY	OBS							1												1
	EST							2												2
	#LM							1												1
	MM							620												620

WASHINGTON HATCHERY (FINAL)

ELWHA	OBS									2	1									3
	EST									2	1									3
	#LM									2	1									3
	MM									635	710									660

CONTINUE (Y/N)?Y27 OCT 1987

1985 RECOVERIES OF TAGCODE

051519
BY CALENDAR MONTH

FISHERY

AREA..... DATA JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC UNK TOTAL

NW VANCOUVER ISLAND TROLL (25-27) (FINAL)

STATISTICAL AREA 25	OBS																		1	1
	EST																		1	1
	#LM																		1	1
	MM																		706	706
STATISTICAL AREA 26	OBS																		1	2
	EST																		6	14
	#LM																		1	2
	MM																		509	569
FISHERY TOTALS:	OBS																		1	3
	EST																		6	15
	#LM																		1	3
	MM																		509	614

SW VANCOUVER ISLAND TROLL (21,23,24) (FINAL)

STATISTICAL AREA 21	OBS																		1	3
	EST																		5	16
	#LM																		1	3
	MM																		484	572
STATISTICAL AREA 23	OBS																		5	6
	EST																		25	29
	#LM																		5	6
	MM																		586	596
STATISTICAL AREA 24	OBS																		2	3
	EST																		9	14
	#LM																		2	3
	MM																		579	557
STAT. AREAS 21, 23	OBS																		4	5
	EST																		18	23
	#LM																		4	4
	MM																		567	567
STAT. AREAS 23-24	OBS																		1	3
	EST																		7	14
	#LM																		1	1
	MM																		605	605
FISHERY TOTALS:	OBS																		3	20
	EST																		14	96
	#LM																		3	17
	MM																		547	579

JUAN DE FUCA NET (STAT. AREA 20) (FINAL)

STATISTICAL AREA 20	OBS																		5	5
	EST																		23	23
	#LM																		5	5
	MM																		551	551
TOTALS FOR 051519	OBS																		7	66
FOR 1985	EST																		30	221
	#LM																		7	63
	MM																		540	610

SORTING TAGCODE 051520.....

GRAND TOTALS FOR	OBS																		7	66
051519:	EST																		30	221
	#LM																		7	63
	MM																		540	610

051520
BY CALENDAR MONTH

RELEASING AGENCY: FWS

82 COHO

TAGGED: 3489

RELEASED: 04/84

STUDY TYPE: E

#/LB:

UNTAGGED: 112

STOCK...: ELWHA

% TAG LOSS: 3.1

SITE: ELWHA R

HATCHERY: LOWER ELWHA

DAYS: 43

FISHERY

AREA.....		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	UNK	TOTAL
PUGET SOUND NET (FINAL)															
3 CLALLAM BAY	OBS									2					2
	EST									3					3
	#LM									2					2
	MM									685					685
ELWHA RIVER	OBS								2	2					4
	EST								5	5					9
	#LM								2	2					4
	MM								615	660					638
FISHERY TOTALS:	OBS								2	4					6
	EST								5	7					12
	#LM								2	4					6
	MM								615	673					653
WASHINGTON HATCHERY (FINAL)															
ELWHA	OBS								1				1		2
	EST								1				1		2
	#LM								1				1		2
	MM								740				730		735
SW VANCOUVER ISLAND TROLL (21,23,24) (FINAL)															
STATISTICAL AREA 23	OBS						1		1						2
	EST						5		6						11
	#LM						1		1						2
	MM						579		616						598
TOTALS FOR 051520	OBS						1		4	4			1		10
	EST						5		12	7			1		26
	#LM						1		4	4			1		10
	MM						579		647	673			730		659
FOR 1985															
SORTING TAGCODE 051521.....															
GRAND TOTALS FOR 051520:	OBS						1		4	4			1		10
	EST						5		12	7			1		26
	#LM						1		4	4			1		10
	MM						579		647	673			730		659

051521
BY CALENDAR MONTH

RELEASING AGENCY: FW5

82 COHO TAGGED: 3542

RELEASED: 05/84

STUDY TYPE: E

#/LB: UNTAGGED: 83

STOCK...: ELWHA

% TAG LOSS: 2.3

SITE: LK MILLS

HATCHERY: LOWER ELWHA

DAYS: 43

FISHERY

AREA.....	DATA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	UNK	TOTAL
OREGON OCEAN TROLL (FINAL)															
ASTORIA	OBS							1	1						2
	EST							4	3						7
	#LM							1	1						2
	MM							611	520						566
OREGON OCEAN SPORT (FINAL)															
ASTORIA	OBS							1							1
	EST							2							2
	#LM							1							1
	MM							570							570
WINCHESTER	OBS							1							1
	EST							3							3
	#LM							1							1
	MM							535							535
FISHERY TOTALS:	OBS							2							2
	EST							4							4
	#LM							2							2
	MM							553							553
WASHINGTON OCEAN TROLL (FINAL)															
2 GRAYS HARBOR	OBS							1							1
	EST							6							6
	#LM							1							1
	MM							530							530
PUGET SOUND SPORT (FINAL)															
6 PORT ANGELES	OBS									1					1
	EST									6					6
PUGET SOUND NET (FINAL)															
4B NEAH BAY	OBS							1	1						2
	EST							2	2						5
	#LM							1	1						2
	MM							520	560						540
5 CLALLAM BAY	OBS									3					3
	EST									5					5
	#LM									3					3
	MM									610					610
7 SAN JUAN ISLANDS	OBS									1					1
	EST									3					3
	#LM									1					1
	MM									740					740
ELWHA RIVER	OBS									6					6
	EST									14					14
	#LM									6					6
	MM									642					642
FISHERY TOTALS:	OBS							1	1		10				12
	EST							2	2		21				26
	#LM							1	1		10				12
	MM							520	560		642				625

CONTINUE (Y/N)?Y27 OCT 1987

1985 RECOVERIES OF TAGCODE

051521

BY CALENDAR MONTH

FISHERY

AREA..... DATA JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC UNK TOTAL

WASHINGTON OCEAN SPORT (CHARTER BOAT) (FINAL)

1 COLUMBIA RIVER	OBS		1										1
	EST		1										1
	#LM		1										1
	MM		510										510

WASHINGTON OCEAN SPORT (KICKER BOAT) (FINAL)

1 COLUMBIA RIVER	OBS		1										1
	EST		3										3
	#LM		1										1
	MM		640										640
4 CAPE FLATTERY	OBS		1										1
	EST		2										2
	#LM		1										1
	MM		590										590
FISHERY TOTALS:	OBS		2										2
	EST		4										4
	#LM		2										2
	MM		615										615

WASHINGTON OCEAN TROLL (INDIAN) (FINAL)

4 CAPE FLATTERY	OBS						1						1
	EST						7						7
	#LM						1						1
	MM						580						580

SW VANCOUVER ISLAND TROLL (21,23,24) (FINAL)

STATISTICAL AREA 21	OBS						1						1
	EST						4						4
	#LM						1						1
	MM						597						597
STATISTICAL AREA 23	OBS		1	3	1								5
	EST		5	18	4								28
	#LM		1	3	1								5
	MM		593	577	631								591
STATISTICAL AREA 24	OBS						3						3
	EST						19						19
	#LM						3						3
	MM						593						593
STAT. AREAS 21, 23	OBS		2	1	2								5
	EST		11	6	9								25
	#LM		2	1	2								5
	MM		526	461	598								542
STAT. AREAS 23-24	OBS		1										1
	EST		5										5
	#LM		1										1
	MM		491										491
FISHERY TOTALS:	OBS		4	7	4								15
	EST		21	42	18								81
	#LM		4	7	4								15
	MM		534	567	606								569

JUAN DE FUCA NET (STAT. AREA 20) (FINAL)

STATISTICAL AREA 20	OBS						1						1
	EST						4						4
	#LM						1						1
	MM						587						587

CONTINUE (Y/N)?Y27 OCT 1987

1985 RECOVERIES OF TAGCODE

051521

BY CALENDAR MONTH

FISHERY

AREA.....	DATA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	UNK	TOTAL
TOTALS FOR 051521	OBS							10	11	7	10				38
FOR 1985	EST							39	52	35	21				147
	#LM							10	11	6	10				37
	MM							541	571	598	642				587

SORTING TAGCODE 051522.....															
GRAND TOTALS FOR	OBS							10	11	7	10				38
051521:	EST							39	52	35	21				147
	#LM							10	11	6	10				37
	MM							541	571	598	642				587

BY CALENDAR MONTH

RELEASING AGENCY: FWS

82 COHO

TAGGED: 3275

RELEASED: 05/84

STUDY TYPE: E

#/LB:

UNTAGGED: 243

STOCK...: ELWHA

% TAG LOSS: 6.9

SITE: ELWHA R

HATCHERY: LOWER ELWHA

DAYS: 42

FISHERY

AREA.....		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	UNK	TOTAL
OREGON OCEAN TROLL (FINAL)															
ASTORIA	OBS						1								1
	EST						4								4
	#LM						1								1
	MM						600								600
OREGON OCEAN SPORT (FINAL)															
DEPOE BAY	OBS						1								1
	EST						2								2
	#LM						1								1
	MM						620								620
WASHINGTON OCEAN TROLL (FINAL)															
3 QUILLAYUTE	OBS						1								1
	EST						8								8
	#LM						1								1
	MM						510								510
PUGET SOUND SPORT (FINAL)															
5 SEKIU	OBS						1			1					2
	EST						5			2					7
	#LM						1								1
	MM						530								530
PUGET SOUND NET (FINAL)															
4B NEAH BAY	OBS									2					2
	EST									5					5
	#LM									2					2
	MM									660					660
5 CLALLAM BAY	OBS						2			1		1			4
	EST						4			3		2			8
	#LM						2			1		1			4
	MM						565			690		730			638
ELWHA RIVER	OBS									3		4			7
	EST									7		9			16
	#LM									3		4			7
	MM									683		663			671
FISHERY TOTALS:	OBS						2			6		5			13
	EST						4			15		11			30
	#LM						2			6		5			13
	MM						565			677		676			659
WASHINGTON OCEAN TROLL (INDIAN) (FINAL)															
3 QUILLAYUTE	OBS									1					1
	EST									33					33
	#LM									1					1
	MM									580					580
WASHINGTON HATCHERY (FINAL)															
ELWHA	OBS												1		1
	EST												1		1
	#LM												1		1
	MM												750		750

1985 RECOVERIES OF TAGCODE

BY CALENDAR MONTH

[illegible]

STATISTICAL AREA 25	OBS	1	1
	EST	4	4
	FLM	1	1
	MM	631	631

STATISTICAL AREA 21	OBS	1	1
	EST	3	3
	#LM	1	1
	MM	606	606

STATISTICAL AREA 23	085	1	9	1	5
	EST	5	16	9	25
	#LM	1	9	1	5
	MM	595	548	540	556

STATISTICAL AREA 24	OB5	1	1
	EST	4	4
	#LM	1	1
	MM	631	631

STAT. AREAS 21, 23	OB5	1	1
	EST	6	6
	#LM	1	1
	MM	697	697

STAT. AREAS 23-24	OB5	1	1	1	3
	EST	5	4	3	10
	#LM	1	1		2
	MM	642	614		628

STAT. AREA5 21,23,24 OBS	1	1
EST	7	7
#LM	1	1
MM	630	630

FISHERY TOTALS:	OBS	2	5	4	1	12
	EST	11	27	17	3	58
	#LM	2	5	4		11
	MM	619	581	599		594

STATISTICAL AREA 20	OBS	1	1
	EST	4	4
	#LM	1	1
	MM	530	530

STATISTICAL AREA 11	OBS	1	1
	EST	3	3
	PLM	1	1
	MM	630	630

TOTALS FOR 051522	OB5	8	8	12	6	1	35
FOR 1985	EST	33	67	37	14	1	153
	MLM	8	8	11	5	1	33
	MM	578	581	644	676	750	621

GRAND TOTALS FOR	OBS	8	8	12	6	1	35
051522:	EST	33	67	37	14	1	153
	BLM	8	8	11	5	1	33
	MM	578	581	644	676	750	621

051023
BY CALENDAR MONTH

RELEASING AGENCY: FWS

82 COHO

TAGGED: 3770

RELEASED: 05/84

STUDY TYPE: E

#/LB:

UNTAGGED: 77

STOCK...: ELWHA

% TAG LOSS: 2.0

SITE: ELWHA R

HATCHERY: LOWER ELWHA

DAYS: 42

FISHERY

AREA.....	DATA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	UNK	TOTAL
WASHINGTON OCEAN TROLL (FINAL)															
2 GRAYS HARBOR	OBS							1							1
	EST							6							6
	#LM							1							1
	MM							540							540
PUGET SOUND NET (FINAL)															
ELWHA RIVER	OBS									18					18
	EST									42					42
	#LM									18					18
	MM									667					667
WASHINGTON OCEAN SPORT (CHARTER BOAT) (FINAL)															
1 COLUMBIA RIVER	OBS							1							1
	EST							2							2
	#LM							1							1
	MM							650							650
WASHINGTON HATCHERY (FINAL)															
ELWHA	OBS											1	5		6
	EST											1	6		7
	#LM											1	5		6
	MM											680	672		673
NW VANCOUVER ISLAND TROLL (25-27) (FINAL)															
STATISTICAL AREA 25	OBS									1					1
	EST									7					7
	#LM									1					1
	MM									629					629
SW VANCOUVER ISLAND TROLL (21,23,24) (FINAL)															
STATISTICAL AREA 21	OBS							1							1
	EST							5							5
	#LM							1							1
	MM							537							537
STATISTICAL AREA 23	OBS							2	2	1					5
	EST							9	11	3					23
	#LM							2	2	1					5
	MM							580	530	708					586
STATISTICAL AREA 24	OBS							1	1						2
	EST							5	5						10
	#LM							1	1						2
	MM							586	704						645
STAT. AREAS 21, 23	OBS									1					1
	EST									6					6
	#LM									1					1
	MM									639					639
STAT. AREAS 23-24	OBS									1					1
	EST									5					5
	#LM									1					1
	MM									660					660

CONTINUE (Y/N) 7Y27 OCT 1987

1985 RECOVERIES OF TAGCODE

051523

BY CALENDAR MONTH

FISHERY

AREA..... DATA JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC UNK TOTAL

SW VANCOUVER ISLAND TROLL (21,23,24) (FINAL) - (CONTINUED)

FISHERY TOTALS:	OBS	4	5	1													10
	EST	20	26	3													49
	#LM	4	5	1													10
	MM	571	613	708													605
TOTALS FOR 051523	OBS	5	6	2	18	1	5										37
FOR 1985	EST	25	28	10	42	1	6										112
	#LM	5	6	2	18	1	5										37
	MM	565	619	669	667	680	672										647
GRAND TOTALS FOR	OBS	5	6	2	18	1	5										37
051523:	EST	25	28	10	42	1	6										112
	#LM	5	6	2	18	1	5										37
	MM	565	619	669	667	680	672										647

TAGCODES REPORTED: 11 -- PAGES: 28